

Carpal bones - superior 4 with ulna + radius  
- inferior 4 with bones above them + with metacarpals.

Metacarpals - with carpal + phalange bones.

Coxal bone - with head of femur at acetabulum.  
- with sacrum.

Femur - with acetabulum of coxal bone at the head.  
- with condyles of tibia at the condyles.  
- with posterior surface of patella at patellar facet.

Patella - posterior surface with condyles + patellar surface of femur.

Tibia - with condyles of femur at condyles.  
- with head of fibula at fibular facet.  
- with lateral malleolus of fibula at fibula notch.  
- with trochlea of talus at medial malleolus.



## Wrist bones

Calcaneus - with talus and with the cuboid.

Talus - with navicular at head.

- with calcaneus.
- with distal surface of tibia at trochlea.
- with medial + lateral malleoli.

Navicular - with head of talus.

- with 3 cuneiform bones.

Cuboid - with calcaneus.

- with bases of 4<sup>th</sup> + 5<sup>th</sup> metatarsals.
- with 3<sup>rd</sup> cuneiform.
- with navicular (occasionally)

Cuneiform - 1<sup>st</sup> - with navicular.

- with bases of 1<sup>st</sup> + 2<sup>nd</sup> metatarsals.
- with 2<sup>nd</sup> cuneiform.
- 2<sup>nd</sup> - with navicular.
- with base of 2<sup>nd</sup> metatarsal.
- with 1<sup>st</sup> + 3<sup>rd</sup> cuneiform.
- 3<sup>rd</sup> - with navicular.
- with bases of 2<sup>nd</sup>, 3<sup>rd</sup>, + 4<sup>th</sup> metatarsals.
- with cuboid.
- with 2<sup>nd</sup> cuneiform.



## Supinators

### 1. Brachioradialis

- long flat muscle - radial nerve forearm.

Origin - lateral epicondyle.

Insertion - Styloid process of radius.

Action - In extension + pronation - supinates.  
" flexion + supination - pronates.



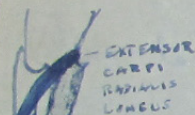
### 2. Extensor Carpi Radialis Longus

- long flat muscle, dorsal to brachioradialis.

Origin - lateral epicondyle.

Insertion - Base of 2<sup>nd</sup> metacarpal.

Action - Supinates



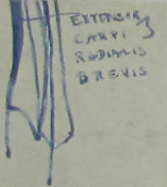
### 3. Extensor Carpi Radialis Brevis

- medial + adjacent to E.C.R.L.

Origin - lateral epicondyle.

Insertion - Base of 3<sup>rd</sup> metacarpal.

Action - Assists in supination.

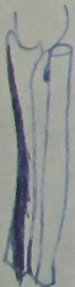


### 4. Extensor Carpi Ulnaris

Origin - Proximal  $\frac{2}{3}$  dorsal surface of ulna.

Insertion - Base of 5<sup>th</sup> metacarpal.

Action - Supinates forearm.



### 5. Supinator

- flat, rhomboid muscle, runs down + laterally curving around dorsal surface of radius.

Origin - lateral epicondyle + supinator crest of ulna.

Insertion - Volar lateral surface of radius superior to oblique line.

Action - Strongest supinator.





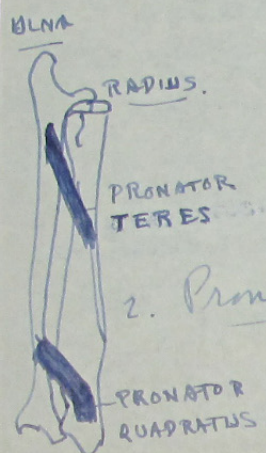
Forearm.Pronators.1. Pronator quadratus.

- flat deep muscle.
- crossed by all the tendons of the flexor group.

Origin. - Pronator ridge of ulna (distal end)

Insertion. - Pronator ridge of radius (distal end)

Action. - Strongest pronator of forearm.

2. Pronator teres.

- round muscle, extending down + laterally.

Origin. - Medial epicondyle of humerus +  
Coronoid process of ulna.

Insertion. - Pronator ridge of radius (proximal end.)

Action. - Pronates forearm.

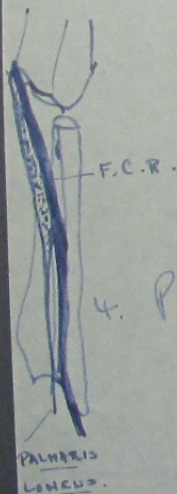
3. Flexor Carpi Radialis.

- long, round muscle, median position of forearm.

Origin. - Medial epicondyle.

Insertion. - Base of second metacarpal.

Action. - Pronates forearm.

4. Palmaris longus.

- round muscle, medial + parallel to F.C.R.

Origin. - Medial epicondyle.

Insertion. - Palmar fascia.

Action. - Pronates forearm.



# UPPER ARM MUSCLES.

MUSCLE	ORIGIN	INSERTION	ACTION.
<u>Brachialis</u> (1 head)	post lower half of humerus	coronoid of ulna	flexes elbow
<u>Deltoids</u> (anterior & heads)	upper back shaft of humerus glenoid cavity	acromion of scapula	extends shoulder joint
<u>Biceps</u> 2 heads	long muscle - glenoid cavity short muscle - coronoid of ulna	tuberosity of radius	flexes & supinates forearm.



## FOREARM MUSCLES

## WRIST

MUSCLE	ORIGIN	INSERTION	ACTION
<u>superficial group</u>	<p>condyles of humerus</p> <p>flexors - medial epicondyle</p> <p>extensors - lateral "</p>	<p>meta-carpals</p> <p>phalanges</p>	
<u>deep group</u>	<p>forearm bones.</p> <p>flexors - from front</p> <p>extensors - from back</p>	<p>metacarpals +</p> <p>phalanges</p>	<p>on all joints</p> <p>in front - flex</p> <p>in back - extend</p> <p>medial side - adduct</p> <p>lateral side - abduct</p>



# FINGER FLEXORS.

MUSCLE	ORIGIN	INSERTION	ACTION
<u>superficial group</u>	finger tendon (pulley for deep group)		pulley for deep fascia.
<u>deep group</u>		terminal phalanx	flexes fingers & wrist.
<u>flexor retinaculum</u>	ligament bridging carpal bone arch at wrist - making tunnel for flexor tendons.		
<u>flexor digitorum</u> or <u>interos digitorum</u>		to all 4 fingers	



## SHORT MUSCLES OF HAND.

MUSCLE	ORIGIN	INSERTION	ACTION
<u>Thenar</u> (ball of thumb)	flexor retinaculum lateral carpal bones	bases of thumb	performs opposition (oppose)
<u>Hypothenar</u> (ball of little finger)			deepen palm on medial side
<u>Inter-ossii</u> (between metacarpals)		extensor tendons of fingers	spread + extend fingers
<u>Pronator</u>	medial epicondyle - front of ulna	on Radius	pronate forearm
<u>Supinator</u>	lateral epicondyle	neck of radius	supinates hand



# SHOULDER JOINT MUSCLES.

MUSCLE	ORIGIN	INSERTION	ACTION
	from trunk (thorax)	scapula & humerus	stabilizes shoulder joint
	from scapula & clavicle	humerus - near shoulder joint	
		pull humerus forward as flexor	
		" " backward " extensors	
		" " laterally " abductors	
<u>Teres (major)</u> (rotator)	from lateral border of scapula	front of humerus (medial rotator)	draws arm down & back
(minor)		back of humerus (lateral rotator)	rotates humerus outward & adducts it
<u>Serratus Anterior</u>	eight upper ribs	medial border of scapula	pulls scapula towards origin



# HIP MUSCLES

MUSCLE	ORIGIN	INSERTION	ACTION.
<u>hip-flexors</u>	pull vertically in front of joint in 2 relays.		
<u>ilio-psaos</u> (upper) (crosses front of hip)	lumbar vertebrae ilic fossa	lesser trochanter	flexes hip.
<u>rectus-femoris</u> (lower) (down front of thigh)	anterior inferior spine of iliac	tuberosity of tibia	extends leg.





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